

IN THE CLAIMS

1. (currently amended) A die having a through hole for use in an extrusion process to reduce ~~[[the]]~~ a diameter of a metal pipe or tube,

the through hole having an inside surface including a bell portion, an approach portion, and a bearing portion from the entrance side of said die formed in a continuous manner, wherein

~~[[the]]~~ a diameter of the through hole at said bell portion gradually decreases from ~~[[the]]~~ an entrance ~~[[side]]~~ part of said bell portion to ~~[[the]]~~ an exit ~~[[side]]~~ part of said bell portion,

~~[[the]]~~ a diameter of ~~the through hole at~~ said approach portion is D1 on ~~[[the]]~~ an entrance ~~[[side]]~~ part of said approach portion and D2 on ~~[[the]]~~ an exit ~~[[side]]~~ part of said approach portion, **[[and]] the diameter of said approach portion** gradually decreases **decreasing** from the entrance ~~[[side]]~~ part of said approach portion to the exit ~~[[side]]~~ part of said approach portion to satisfy Equation (1):

$$0.7 \leq D2/D1 < 0.97 \qquad \dots(1)$$

~~[[the]]~~ a die half angle of ~~an inside surface where the~~ a first part of said approach portion having a diameter D3 ~~is D2/0.97~~ is not less than ~~[[the]]~~ a die half angle of ~~an inside surface~~ a second part of said approach portion nearer to the exit ~~[[side]]~~ part of said approach portion than the ~~inside surface where the diameter is D3~~ first part, the diameter D3 **is being** D2/0.97,

~~[[the]]~~ an axial length LR ~~[[from]]~~ between the first part and the exit part of said

~~approach portion inside surface where the diameter is D3 to the inside surface where the diameter is D2~~ satisfies Equation (2):

$$20 \leq LR / ((D3 - D2) / 2) \leq 115 \quad \dots(2)$$

~~[[the]] a diameter of the through hole in said bearing portion is fixed at D2, and~~
[[the]] a length of said bearing portion is LB, the length LB satisfying and
satisfies Equation (3):

$$0.3 \leq LB / D2 \leq 10 \quad \dots(3)$$

2. (currently amended) A method of manufacturing a stepped metal pipe or tube, comprising:

pushing a metal pipe or tube into a die in an axial direction, said die having a through hole for use in an extrusion process to reduce the diameter of a metal pipe or tube,

said through hole having an inside surface including a bell portion, an approach portion, and a bearing portion from the entrance side formed in a continuous manner, wherein

~~[[the]] a diameter of the through hole at said bell portion gradually decreases from the entrance~~ ~~[[side]] part~~ of said bell portion to the exit ~~[[side]] part~~ of said bell portion of the hole,

~~[[the]] a diameter of the through hole at said approach portion is D1 on the~~

entrance ~~[[side]]~~ part of said approach portion and D2 on the exit ~~[[side]]~~ part of said approach portion, ~~[[and]]~~ the diameter of said approach portion gradually decreasing gradually decreases from the entrance ~~[[side]]~~ part of said approach portion to the exit ~~[[side]]~~ part of said approach portion to satisfy Equation (1):

$$0.7 \leq D2/D1 < 0.97 \quad \dots(1),$$

~~[[the]]~~ a die half angle of a first part of said approach portion having a ~~an inside-surface where the diameter D3 is D2/0.97~~ is not less than ~~[[the]]~~ a die half angle of a ~~second part of said approach portion an inside-surface~~ nearer to the exit ~~[[side]]~~ part of said approach portion than the first part, inside-surface where the diameter D3 ~~[[is]]~~ being D2/0.97,

the axial length LR ~~[[from]]~~ between the ~~inside-surface where the diameter is D3~~ to the inside-surface where the diameter is D2 first part and the exit part of said approaching portion satisfies Equation (2):

$$20 \leq LR/((D3-D2)/2) \leq 115 \quad \dots(2),$$

~~[[the]]~~ a diameter of the through-hole in said bearing portion is fixed at D2, and ~~[[the]]~~ a length of said bearing portion is LB, the length LB satisfying and satisfies Equation (3):

$$0.3 \leq LB/D2 \leq 10 \quad \dots(3),$$

said method comprising,

extruding an end of said pushed metal pipe or tube to protrude a prescribed length from the exit side of said die, thereby making the metal pipe or tube into a stepped metal pipe or tube; and

stopping extruding and pushing back the stepped metal pipe or tube in the direction opposite to the direction of pushing the metal pipe or tube.

3. (original) The method of manufacturing a stepped metal pipe or tube according to claim 2, wherein said metal pipe or tube is manufactured by a Mannesmann process.

4. canceled